IN THE CLAIMS:

1. (Currently Amended) A method of ~~analysing~~ analyzing microarray images, the method comprising the steps of:

receiving data from a microarray process,

~~modelling~~ modeling the microarray process to define a microarray model comprising at least one of target distribution defining a first independent sub-model and probe distribution defining a second independent sub-model,

comparing the received data with the microarray model in order to extract information from the data, and

outputting the information.

2. (Original) A method according to claim 1, wherein the data is received from a detector corresponding to a control target sample and a detector corresponding to a test target sample.

3. (Original) A method according to claim 2, wherein the model includes information about statistical similarity in the spot profile corresponding to each detector due to the spot profiles being formed from a common probe.

4. (Currently Amended) A method according to ~~any preceding~~ claim 1, wherein the microarray process is a DNA microarray process.

5. (Currently Amended) A method according to ~~any preceding~~ claim 1, wherein the extracted information is gene expression information.

6. (Currently Amended) A method according to ~~any preceding~~ claim 1 wherein when at least the second independent sub-model is employed in the ~~modelling~~ modeling step, the second independent sub-model comprises a model of the spotting process.

7. (Original) A method according to claim 6, wherein the model of the spotting process includes an understanding of how adjacent spots interact.

8. (Currently Amended) A method according to ~~any preceding~~ claim 1, wherein the ~~modelling~~ modeling step further comprises ~~modelling~~ modeling the interaction between the

background distribution of the received signal and at least one of target distribution and probe distribution.

9. (Original) A method according to claim 8, wherein the background distribution includes non-specific hybridication.

10. (Currently Amended) A method according to ~~any preceding~~ claim 1, wherein the ~~modelling~~ modeling step further comprises ~~modelling~~ modeling fluorescence to define a third independent sub-model.

11. (Original) A method according to claim 10, wherein the third independent sub-model includes information on the effect of DNA sequence on fluorescence.

12. (Currently Amended) A method according to ~~any preceding~~ claim 1, wherein the ~~modelling~~ modeling step further comprises ~~modelling~~ modeling hybridication to define a fourth independent sub-model.

13. (Original) A method according to claim 12, wherein the fourth independent sub-model includes information on the effect of sequence on hybridication.

14. (Currently Amended) A method according to ~~any preceding~~ claim 1, wherein the ~~modelling~~ modeling step further comprises ~~modelling~~ modeling spatial variation of target concentration.

15. (Currently Amended) A method according to ~~any preceding~~ claim 1, wherein the comparing step further comprises comparing the received image data with the microarray model in order to predict missing data.

16. (Original) A method according to claim 15, wherein the missing data is due to saturation in the device which creates the image data.

17. (Currently Amended) A method according to ~~any preceding~~ claim 1, wherein the ~~modelling~~ modeling step further comprises ~~modelling~~ modeling detector nonlinearity.

18. (Currently Amended) A method according to ~~any preceding~~ claim 1, wherein the structure of the microarray model is hierarchical.

19. (Currently Amended) A method according to ~~any preceding~~ claim 1, wherein the data received from the microarray process is image data.

20. (Currently Amended) A method according to ~~any of claims 1 to 18~~ claim 1, wherein the data received from the microarray process is ~~pre-analysed~~ pre-analyzed data.

21. (Currently Amended) A method according to ~~any preceding~~ claim 1, wherein the standard Markov chain Monte Carlo methods are employed.

22. (Currently Amended) An apparatus for ~~analysing~~ analyzing microarray images, the apparatus comprising:

means for receiving data from a microarray process,

means for ~~modelling~~ modeling the microarray process to define a microarray model comprising at least one of target distribution defining a first independent sub-model and probe distribution defining a second independent sub-model,

means for comparing the received data with the microarray model in order to extract information from the data, and

means for outputting the information.

23. (Original) An apparatus according to claim 22, wherein the data is received from a channel corresponding to a control target sample and a channel corresponding to a test target sample.

24. (Currently Amended) An apparatus according to claim ~~22 or claim~~ 22, wherein the microarray process is a DNA microarray process.

25. (Currently Amended) An apparatus according to ~~any of claims 22 to 24~~ claim 22, wherein the extracted information is gene expression information.

26. (Currently Amended) An apparatus according to ~~any of claims 22 to 25~~ claim 22, wherein the means for ~~modelling~~ modeling further comprises means for ~~modelling~~ modeling the interaction between the background distribution of the received signal and at least one of target distribution and robe distribution.

27. (Currently Amended) An apparatus according to ~~any claims 22 to 26~~ claim 22, wherein the means for ~~modelling~~ modeling further comprises means for ~~modelling~~ modeling fluorescence to define a third independent sub-model.

28. (Currently Amended) An apparatus according to ~~any of claims 22 to 27~~ claim 22, wherein the means for ~~modelling~~ modeling further comprises means for ~~modelling~~ modeling hybridication to define a fourth independent sub-model.

29. (Currently Amended) An apparatus according to ~~any of claims 22 to 28~~ claim 22, wherein the means for ~~modelling~~ modeling further comprises means for ~~modelling~~ modeling spatial variation of target concentration.

30. (Currently Amended) An apparatus according to ~~any claims 22 to 29~~ claim 22, wherein the means for comparing further comprises means for comparing the received image data with the microarray model in order to predict missing data.

31. (Currently Amended) An apparatus according to ~~any of claims 22 to 30~~ claim 22, wherein the means for ~~modelling~~ modeling further comprises means for ~~modelling~~ modeling detector nonlinearity.

32. (Currently Amended) An apparatus according to ~~any of claims 22 to 31~~ claim 22, wherein the data received from the microarray process is image data.

33. (Currently Amended) An apparatus according to ~~any of claims 22 to 31~~ claim 22, wherein the data received from the microarray process is pre-~~analysed~~ analyzed data.